Order Approving the U.S Army Corps of Engineer's Request for a Waiver to the State's Total Dissolved Gas Water Quality Standard

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

In the matter of the U.S. Army Corps of Engineers' request to spill water to assist out-migrating threatened and endangered salmon smolts	))))	FINDINGS and ORDER

Findings

1. The Department of Environmental Quality received a request from the U.S. Army Corps of Engineers dated November 30, 2006, to adjust the Total Dissolved Gas Standard as necessary to spill water over McNary, John Day, The Dalles and Bonneville Dams on the Lower Columbia River to assist out-migrating threatened and endangered salmon smolts, for a year-round period. The application sought approval for five years. The public was notified of the request on January 02, 2007 and given the opportunity to provide written comments until 5:00 p.m. on February 01, 2007.

2. Acting under **OAR 340-041-0104(3)** the Commission finds that:

   (a) Failure to act would result in greater harm to salmonid stock survival through in-river migration than would occur by increased spill:

Estimated mortality from fish passing through turbines is between 8 and 32 percent. Fish passing over spillways as a result of spill experience 0 to 4 percent mortality. Barge and truck transport are alternative modes of fish transport to voluntary spill. Transporting fall Chinook salmon directly from Spring Creek Hatchery by barge to a release site below Bonneville Dam has been studied. A very high percentage of the adult returns from the barged groups strayed to other hatcheries, and the return rates to Spring Creek Hatchery were significantly lower for the barge test groups than for the voluntary spill control group. The USFWS also evaluated the possibility of raising and releasing additional fish to make up for those that would be lost to turbines or other causes during passage at Bonneville Dam in the absence of spill. It would not be possible to raise additional fish because rearing space, water supply, and waste treatment capability are limited. It would also not be feasible to release fish at a later date because of limited hatchery capacity since these fish would continue to grow and exceed hatchery space capacity.

(b) The modified total dissolved gas criteria associated with the increased spill provides a reasonable balance of the risk of impairment due to elevated total dissolved gas to both resident biological communities and other migrating fish and to migrating adult and juvenile salmonids when compared to other options for in-river migration of salmon:

According to 10 years of biological monitoring in the lower Columbia River at Bonneville and MaNary dams, there has been less than 1 percent incidence of gas bubble disease when total dissolved gas is limited to 115% in the forebay and 120% in tailrace. Comparatively, in 1996, when total dissolved gas limits exceeded 115% in the forebay and 120% in the tailrace there was a 4 percent incidence of gas bubble disease. The low incidence of gas bubble disease observed has been regarded as a low risk for mortality from gas bubble disease. Resident fish and aquatic invertebrates in the Columbia River downstream of Bonneville Dam were monitored by National Marine Fisheries Service for signs of gas bubble disease from 1993 to 1998. There were no signs of gas bubble disease observed in the aquatic invertebrates examined. There was a low incidence of gas bubble disease (less than one percent) in resident fish examined in 1993 and 1995 while in 1994, 1997 and 1998 none of the fish observed had signs of gas bubble disease. Signs of gas bubble disease were prevalent in 1996 but this was a high flow year with large volumes of involuntary spill and total dissolved gas levels above 115 percent in the forebays and 120 percent in the tail races of dams. Given the past monitoring of gas bubble disease, the levels requested in this petition strike a reasonable balance between increased survival due to reduced turbine mortality and the risk of mortality from gas bubble disease.

c) Adequate data will exist to determine compliance with the standards:

The Corps has submitted a physical monitoring plan. Physical in-river total dissolved gas monitoring will be conducted in the forebay and tailraces of McNary, John Day, The Dalles, and Bonneville Dams. Hourly data will be available on the Corps' Internet page. Implementation of the physical monitoring plan will ensure that data will exist to determine compliance with the standards for the voluntary spill program.

d) Biological monitoring is occurring to document that the migratory salmonid and resident biological communities are being protected:

The Corps has submitted a biological monitoring plan. Juvenile salmonids will be collected at Bonneville and McNary Dams and examined and evaluated for incidence of Gas Bubble Trauma, and will be assign ranks based on severity of symptoms. Biological monitoring will occur according to the Fish Passage Center Gas Bubble Trauma Monitoring Program Protocol for Juvenile Salmonids.

Order

3. The Environmental Quality Commission approves a modification to the Total Dissolved Gas standard for voluntary spill at McNary, John Day, The Dalles and Bonneville Dams on the Lower Columbia River, subject to the following conditions:

(i) A modified total dissolved gas standard for the Columbia River applies:

a) during the fish passage voluntary spill 10-day period in March for the purpose of Spring Creek Hatchery, and the period from midnight on April 1 to midnight on August 31 for the purpose of fish passage; and

b) during any period of voluntary spill that occurs outside the periods specified in 3(i)(a) above, if the spill is for the purpose of biological or physical studies of spillway structures and prototype fish passage devices to test spill at operational levels, and the U.S. Army Corps of Engineers has notified the Department in writing of such actions at least one week prior to the voluntary spill and conduct physical and biological monitoring during these periods of voluntary spill.

(ii) The modified total dissolved gas criteria will apply for 2008 and 2009.

(iii) Spill must be reduced when the average total dissolved gas concentration of the 12 highest hourly measurements per calendar day exceeds 115% of saturation in the forebays of McNary, John Day, The Dalles, and Bonneville Dams monitoring stations.

(iv) Spill must be reduced when the average total dissolved gas concentration of the 12 highest hourly measurements per calendar day exceeds 120% of saturation in the tailraces of McNary, John Day, The Dalles, and Bonneville Dams monitoring stations.

(v) Spill must be reduced when instantaneous total dissolved gas levels exceed 125% of saturation for any 2 hours during the 12 highest hourly measurements per calendar day.

(vi) The Department may approve changes in the location of forebay and tailrace monitors, use of forebay monitors, and may approve changes to the method for calculating total dissolved gas. Before approving any changes, the Department must consult with the Adaptive Management Team or the Federal Columbia River Power System Water Quality Team or both. The Department is directed to begin this process for consultation immediately and to evaluate and, if appropriate, approve such changes as soon as possible.

(vii) If 15 percent or more of the juvenile fish examined show signs of gas bubble disease in their non-paired fins where more than 25 percent of the surface area of the fin is

occluded by gas bubbles or that contra-indicatory evidence suggests that fish are being harmed, the Director must terminate the modification.

(viii) The Corps must provide written notice to the Department within 24 hours of any violations of the conditions in the modification as it relates to voluntary spill. Such notice must include actions proposed to reduce total dissolved gas levels or the reason(s) for no action.

(ix) No later than December 31 for each year of this waiver, the Corps must provide an annual written report to the Department detailing the following:
a) flow and runoff descriptions for the spill season;
b) spill quantities and durations;
c) quantities of water spilled for fish versus spill for other reasons for each project;
d) data results from the physical and biological monitoring programs, including incidences of gas bubble disease;
e) description and results of any biological or physical studies of spillway structures and prototype fish passage devices to test spill at operational levels; and
f) progress on implementing the measures contained in the 2002 Lower Columbia River Total Dissolved Gas Total Maximum Daily Load (TMDL).

(x) If requested, the Corps must report to the Commission on any of the above matters or other matters relevant to this Order.

(xi) The Commission reserves the right to terminate or modify this modification at any time.

Adaptive Management

The process for reviewing the implementation status of the 2002 Lower Columbia River Total Dissolved Gas TMDL will begin no later than January 1, 2011. The Washington State Department of Ecology will convene an advisory group comprising representatives of Oregon Department of Environmental Quality, tribes, federal and state agencies to evaluate appropriate points of compliance for this TMDL. Based on these findings, further studies may be needed, and structural and operational gas abatement activities will be redirected or accelerated if needed. After 2010, the location of total dissolved gas monitors will be consistent with the Adaptive Management implementation strategy for the 2002 Lower Columbia River Total Dissolved Gas TMDL, and may no longer require forebay monitors and may only require tailrace monitors as TMDL implementation transitions from short-term to long-term strategies.

Dated: 6-22-07

ON BEHALF OF THE COMMISSION

Stephanie Hallock
Director